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THE POTATO BEETLES OF FLORIDA (Coleoptera: Chrysomelidae)[1]

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INTRODUCTION: True "potato beetles" are members of the beetle genus Leptinotarsa, with 32 species in North America, including Mexico; 10 species in the continental United States, including 2 species in Florida. The most notable is the Colorado potato beetle, Leptinotarsa decemlineata (Say), found in Florida and most of the United States, and introduced into Europe and parts of Asia. It is a serious pest of potatoes and other solanaceous plants.

The family Chrysomelidae, or leaf beetles, is one of the 7 largest families of Coleoptera. All members are phytophagous, both as larvae and as adults. Some feed on roots, others on stems or leaves of herbaceous plants, and some mine the leaves of woody plants. They belong to the subfamily Chrysomelinae represented by over 2,000 species distributed throughout the world. Most larvae of the Chrysomelinae live openly on plants while feeding, and they usually burrow into soil to pupate. Many economically important species are found in this subfamily.

DESCRIPTION: (Fig. 1 & 2) The genus Leptinotarsa is assigned to the tribe Doryphorini containing 3 genera in the United States, recognized by having the procoxal cavities open behind, simple claws separate at base and usually divergent. Species of Leptinotarsa are recognized by the following features: maxillary palpi with apical segment shorter than preceding, truncate; mesosternum not raised above the level of prosternum; profemur of male simple.

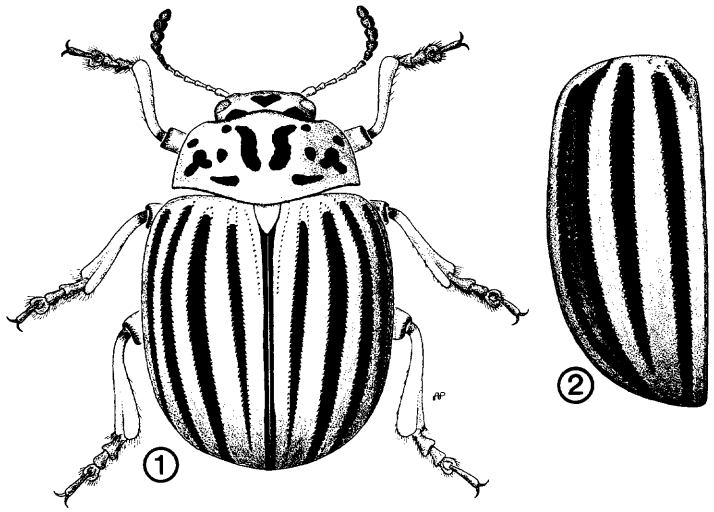

Fig. 1. Leptinotarsa decemlineata (Say.). Fig. 2. Leptinotarsa juncta (Germar), left elytron.

Two species of Leptinotarsa occur in Florida: L. decemlineata, the "Colorado potato beetle", and L. juncta (Germar). The latter incorrectly has been called the "false Colorado potato beetle" because of its similarity to L. decemlineata, but is more appropriately called the "horse-nettle beetle". L. decemlineata has pale yellow elytra, outlined in black; each elytron with 5 vittae; vitta 1 shorter than other 4 and adjacent to the sutural margin; vittae 2 thru 5 extending more than half the length of the elytron and very distinct; punctation coarse in irregular rows. L. juncta with pale yellow elytra, with 5 black vittae; vitta 1 bordering sutural margin, extending from just below the base to the apex; vitta 2 shorter than first, not reaching base; vitta 3 and 4 connecting at apex of elytron; space between black; vitta 5 along lateral margin of elytron; punctation coarse, in very regular rows outlining each vitta. Distinct black spot on outer margin of femur.

DISTRIBUTION: (Fig. 3) Leptinotarsa decemlineata occurs in most areas of the United States, including Florida, where it was first reported in 1920. In Florida the beetle has been reported in the following counties: Alachua, Baker, Brevard, Clay, Duval, Escambia, Gadsden, Gilchrist, Hamilton, Hardee, Highlands, Hillsborough, Holmes, Indian River, Jefferson, Lake, Levy, Liberty, Marion, Okaloosa, Orange, Palm Beach, Polk, Putnam, St. John's, Santa Rosa, Sumter, and Volusia. It was collected in Belle Glade (Palm Beach Co.) in 1947, but has not been reported there since. The southernmost record in peninsular Florida is Vero Beach (Indian River Co.) on the eastern shore and Crewsville (Hardee Co.), and DeSoto City (Highlands Co.) in the south-central part of the state.

Leptinotarsa juncta is found primarily in the southeastern United States from northern Florida to eastern Texas, north to Missouri, southern Illinois and Indiana, and east to Maryland and Virginia. Florida records (DPI) are from Alachua, Jackson, Jefferson, and Leon counties.

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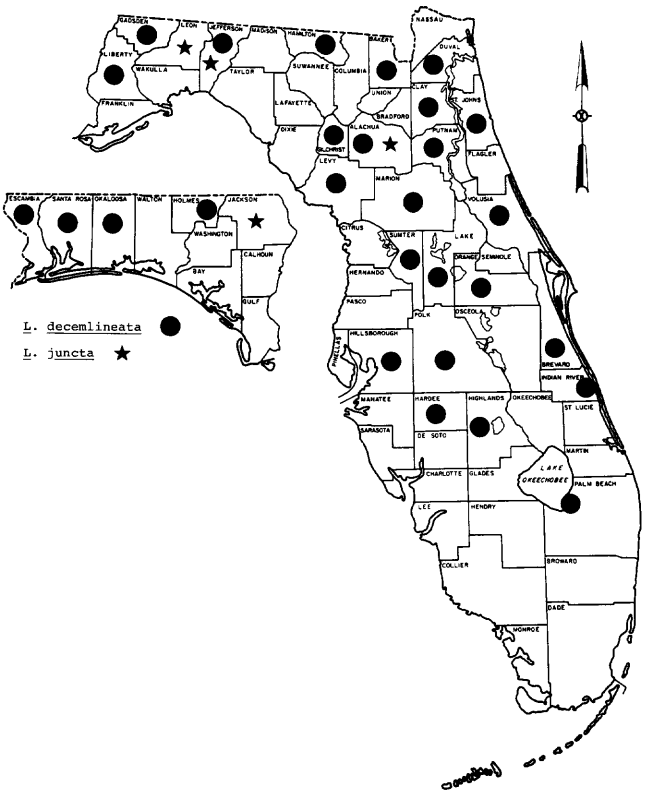

Fig. 3. Distribution of Leptinotarsa decemlineata (Say) [circle] and L. juncta (Germar) [star] in Florida.

BIOLOGY: The life cycle of the colorado potato beetle starts with the adult as the overwintering stage. They dig into the soil to a depth of several inches and emerge in the spring. They feed on newly sprouted host plants where they mate. Females deposit bright orange oval eggs on the surface of the host plant's leaves, usually on the undersurface protected from direct sunlight. An egg mass may contain from 10-40 eggs, and most adult females deposit over 300 eggs during a period of 4 to 5 weeks. Eggs hatch in 4 to 5 days depending in part on temperature and humidity. The 4 larval instars last a total of 21 days. The small, cyphosomatic, reddish larvae feed almost continuously on the leaves of the host plant, stopping only when molting. At the end of the larval period they drop from the plants and burrow into the soil where they construct a spherical cell and transform into a yellowish pupa. This lasts from 5 to 10 days. There are 1 to 3 generations per year, depending on latitude. The life cycle of the horse-nettle beetle is similar to that of the Colorado potato beetle. Eggs hatch in 4 to 5 days and the larvae feed on the leaves of the host plants. There are 4 larval instars lasting 21 days. The larvae drop to the soil to pupate, and pupation lasts 10 to 15 days.

HOSTS: Potatoes are the preferred host for the Colorado potato beetle, but it may feed and survive on a number of other plants in the nightshade family: eggplant, tomato, pepper, tobacco, groundcherry, horse-nettle, common nightshade, belladonna, thornapple, henbane, and its first recorded host plant. The horse-nettle beetle is found primarily on the common noxious weed, horse-nettle, Solanum carolinense L. It also feeds on other solanceous plants, such as species of ground cherry or husk tomato, Physalis spp., and common nightshade, Solanum dulcamara (L.).

HISTORY: The Colorado potato beetle was first discovered by Thomas Nuttal in 1811 and described in 1824 by Thomas Say from specimens collected in the Rocky Mountains on buffalo-bur, Solanum rostratum Ramur. The insect's association with the potato plant, Solanum tuberosum (L.), was not known until about 1859 when it began destroying potato crops about 100 miles west of Omaha, Nebraska. The insect began its rapid spread eastward, reaching the Atlantic coast by 1874. The evolution of the name Colorado potato beetle is curious, since the beetle did not originate in Colorado but is believed to have originated in central Mexico. It had a series of names from 1863 to 1867, including the "ten-striped spearman", "ten-lined potato beetle", "potato-bug", and "new potato bug". Colorado was not connected to the insect until Walsh (1865) stated that 2 of his colleagues had seen large numbers of the insect in the territory of Colorado feeding on buffalo-bur. This convinced him that it was native to Colorado. It was C. V. Riley (1867) who first used the combination: Colorado potato beetle.

KEY TO THE LEPTINOTARSA SPECIES OF FLORIDA

Elytral punctation in regular rows from base to apex, vitta 3 and 4 connect at apex of elytron, space between black; black spot on outer margin of the femur. (southeastern U.S.).....juncta (Germar)

Elytral punctation irregular, not forming regular rows, no black space between vitta 3 and 4; no black spot on legs. (widespread) .....decemlineata (Say)

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